

Supplementary Online Content

Soneji S, Sargent JD, Tanski SE, Primack BA. Associations between initial water pipe tobacco smoking and snus use and subsequent cigarette smoking: results from a longitudinal study of US adolescents and young adults. *JAMA Pediatr*. Published online December 8, 2014. doi:10.1001/jamapediatrics.2014.2697.

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This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix 1. Factor Analysis of Cigarette Smoking Intensity at Follow-up Score

We based the factor score of cigarette smoking intensity at follow-up on the following three survey questions.

1. “During the past 30 days, on how many days did you smoke cigarettes?” (None, 1-10 days, 11-29 days, Every Day)
2. “During the past 30 days, on the days that you smoked, how many cigarettes did you usually smoke per day?” (1-5 cigarettes, 6-10 cigarettes, 11-20 cigarettes, more than 20 cigarettes)
3. “How many cigarettes have you smoked in your life?” (Never smoked, Just a few puffs, 1-19 cigarettes, 20-100 cigarettes, More than 100 cigarettes)

The single factor explains 77.9% of the variance.

eAppendix 2. Parental Cigarette Smoking

We considered a respondent's parent to be a former cigarette smoker if the respondent answered "She/He quit smoking and does not currently smoke" to the question "Which of the following statements best describes your mother's/father's smoking?". We considered a respondent's parent to be a current cigarette smoker if the respondent answered "She/He occasionally smokes" or "She/He smokes daily" to the same survey question. We classified parental cigarette smoking status to be the more recent of the two parents' cigarette smoking status (e.g., parental cigarette smoking status was 'current' if the respondent's mother formerly smoked cigarettes and respondent's father currently smokes cigarettes).

eTable 1. Test of Proportional Odds/Parallel Regression Assumption

Covariate	Likelihood Ratio Statistic	d f	p- value	Likelihood Ratio Statistic	d f	p- value
WTS	0.094	1	0.759			
Snus Use				2.618	1	0.106
Age Group	0.373	1	0.541	0.237	1	0.627
Gender	0.604	1	0.437	0.382	1	0.536
Race/Ethnicity	1.040	1	0.308	0.816	1	0.366
Sensation Seeking Quartile	0.751	1	0.386	0.582	1	0.446
Friends' Smoking Status	3.887	1	0.049	3.951	1	0.047
Parental Smoking Status	0.013	1	0.910	0.031	1	0.859
Ever Binge Drank	0.161	1	0.688	0.086	1	0.770
Maternal Education	0.567	1	0.451	0.412	1	0.521
Household Income	0.533	1	0.465	0.552	1	0.457
Region	0.040	1	0.842	0.017	1	0.897
Rural-Urban	0.306	1	0.580	0.331	1	0.565

Note: WTS=waterpipe tobacco smoking; df=degrees of freedom.

eTable 2. Multivariable Logistic Regression Analyses of Current Binge Drinking at Follow-up Among Baseline Non-Binge Drinkers

Covariate	Model 1. Current Binge Drinking at Follow-Up		Model 2. Current Binge Drinking at Follow-Up	
	Adj. OR	95% CI	Adj. OR	95% CI
WTS	1.93	(0.95, 3.93)		
Snus Use			2.3	(0.83, 6.36)
18-20 Yrs	0.66	(0.37, 1.17)	0.74	(0.42, 1.31)
21-23 Yrs	0.22	(0.09, 0.53)	0.25	(0.1, 0.6)
Male (Ref: Female)	2.15	(1.25, 3.68)	1.86	(1.08, 3.22)
Race/Ethnicity (Ref: Non-Hispanic White)				
Non-Hispanic Black	5.43	(2.08, 14.21)	5.54	(2.14, 14.31)
Hispanic	1.05	(0.3, 3.69)	1.04	(0.3, 3.61)
Non-Hispanic Other	1	(0.4, 2.51)	1.11	(0.44, 2.81)
Sensation Seeking Quartile (Ref: 1 st [Lowest])				
2 nd	0.96	(0.41, 2.22)	0.96	(0.41, 2.23)
3 rd	1.01	(0.49, 2.09)	0.99	(0.48, 2.05)
4 th (Highest)	1.43	(0.66, 3.1)	1.45	(0.66, 3.19)
Friends Smoke (Ref: No)	1.11	(0.6, 2.04)	1.09	(0.6, 1.98)
Parents Smoke (Ref: Never)				
Former	0.71	(0.38, 1.36)	0.71	(0.38, 1.36)
Current	0.62	(0.32, 1.21)	0.61	(0.31, 1.21)
Ever Cigarette Smoked (Ref: No)	1.36	(0.8, 2.32)	1.41	(0.83, 2.39)
Maternal Education (Ref: Less Than High School)				
High School Graduate	1.42	(0.34, 5.88)	1.43	(0.35, 5.81)
At Least Some College	2.33	(0.63, 8.57)	2.34	(0.65, 8.48)
Annual Parental Household Income (Ref: <\$50,000)				
≥\$50,000 and <\$100,000	1.22	(0.59, 2.51)	1.15	(0.54, 2.43)
≥\$100,000	2.17	(0.88, 5.3)	2.21	(0.89, 5.48)
Region (Ref: Midwest)				
Northeast	1.65	(0.75, 3.63)	1.73	(0.78, 3.82)
South	1.25	(0.63, 2.5)	1.26	(0.63, 2.53)
West	1.18	(0.53, 2.59)	1.38	(0.64, 2.98)
Rural-Urban (Ref: Large Rural Town)				
Small Town	1.4	(0.36, 5.53)	1.34	(0.33, 5.47)
Sub-Urban	0.99	(0.31, 3.22)	1.05	(0.32, 3.47)
Urban Core	0.79	(0.27, 2.32)	0.9	(0.31, 2.64)

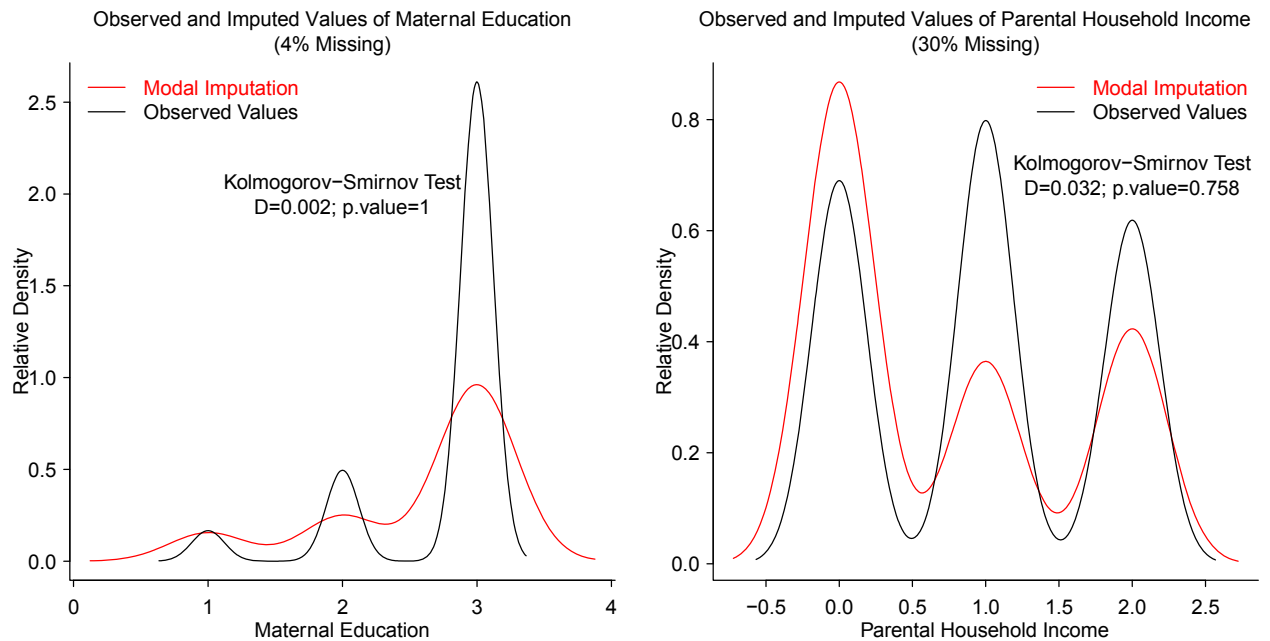
Note: Adj. OR=adjusted odds ratio; CI=confidence interval; WTS=waterpipe tobacco smoking; Ref=reference; Yrs=years

eTable 3. Multivariable Ordinal Logistic Regression Analyses of Intensity of Cigarette Smoking at Follow-up Among Baseline Non-Cigarette Smokers

	Model 5. Intensity of Cigarette Smoking at Follow-Up		Model 6. Intensity of Cigarette Smoking at Follow-Up	
Covariate	Adj. Prop. OR	95% CI	Adj. Prop. OR	95% CI
WTS	2.54	(1.47, 4.38)		
Snus Use			4.43	(1.77, 11.09)
Age Group (Ref: 15-17 Yrs)				
18-20 Yrs	0.85	(0.59, 1.25)	0.99	(0.68, 1.43)
21-23 Yrs	0.65	(0.39, 1.08)	0.69	(0.41, 1.14)
Male (Ref: Female)	1.26	(0.91, 1.74)	1.14	(0.82, 1.58)
Race/Ethnicity (Ref: Non-Hispanic White)				
Non-Hispanic Black	1.74	(0.92, 3.29)	1.8	(0.95, 3.39)
Hispanic	1.76	(0.99, 3.13)	1.65	(0.93, 2.94)
Non-Hispanic Other	1.24	(0.71, 2.15)	1.27	(0.74, 2.2)
Sensation Seeking Quartile (Ref: 1 st [Lowest])				
2 nd	1.31	(0.87, 1.97)	1.31	(0.87, 1.98)
3 rd	1.91	(1.21, 3)	1.82	(1.16, 2.88)
4 th (Highest)	3.22	(2.03, 5.1)	3.21	(2.03, 5.09)
Friends Smoke (Ref: No)	2.1	(1.5, 2.94)	2.1	(1.5, 2.95)
Parents Smoke (Ref: Never)				
Former	1.24	(0.82, 1.87)	1.33	(0.88, 2.01)
Current	1.73	(1.16, 2.58)	1.76	(1.18, 2.64)
Ever Binge Drank (Ref: No)	1.51	(0.97, 2.36)	1.61	(1.04, 2.5)
Maternal Education (Ref: Less Than High School)				
High School Graduate	0.53	(0.25, 1.15)	0.49	(0.22, 1.08)
At Least Some College	0.36	(0.18, 0.73)	0.36	(0.17, 0.74)
Annual Parental Household Income (Ref: <\$50,000)				
≥\$50,000 and <\$100,000	1.14	(0.71, 1.81)	1.15	(0.71, 1.85)
≥\$100,000	1.31	(0.79, 2.16)	1.37	(0.82, 2.27)
Region (Ref: Midwest)				
Northeast	0.88	(0.56, 1.38)	0.95	(0.6, 1.5)
South	0.86	(0.57, 1.3)	0.92	(0.61, 1.39)
West	0.49	(0.29, 0.81)	0.57	(0.34, 0.94)
Rural-Urban (Ref: Large Rural Town)				
Small Town	1.91	(0.96, 3.8)	2.07	(1.03, 4.16)
Sub-Urban	1.07	(0.55, 2.11)	1.16	(0.58, 2.31)
Urban Core	1.07	(0.62, 1.87)	1.22	(0.69, 2.16)

Note: Adj. Prop. OR=adjusted proportional odds ratio; CI=confidence interval; WTS=Waterpipe tobacco smoking; Ref=reference; Yrs=years

eFigure. Densities of Observed and Imputed Values



Note: We checked the plausibility of the imputation model by examining the distribution of imputed values to the distribution of observed values for the two covariates with missing data: [1] maternal education and [2] annual parental household income. We compared the two distributions formally with the Kolmogorov–Smirnov test. The density of observed maternal education values is not significantly different than the density of the modal imputed maternal education values ($p=1$). Similarly, The density of observed parental household income values is not significantly different than the density of the modal imputed paternal household income values ($p=0.758$).